

# Macroeconomic Variables and Financial Sector Output in Nigeria

**Dr. Loretta Anayoozuah<sup>1</sup>, Prof. Steve N. Ibenta<sup>2</sup>, Dr. Ikenna Egungwu<sup>1</sup>**

<sup>1</sup>Department of Banking and Finance, Chukwuemeka Odumegwu Ojukwu University, Anambra State, Nigeria

<sup>2</sup>Department of Banking and Finance, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria

## ABSTRACT

The study investigated the effect of selected macroeconomic variables on the financial sector of Nigeria from 1986 to 2018. The study employed monetary target variables, namely money supply, interest rate, inflation rate, exchange rate and credit to private sector as proxies for macroeconomic variables while the outputs from financial sector on as dependent variable. The data obtained from the Central Bank of Nigeria Statistical Bulletin, were tested subjected to Augmented Dickey-Fuller (ADF) test of stationarity, descriptive statistics, and Autoregressive Distributive Lag (ARDL). The results revealed that macroeconomic variables has 99% significant short run effect but no significant long run effects on financial sector output in Nigeria. Specific findings revealed that money Supply (M2) and Exchange Rate (EXR) have significant positive relationships with growth of the financial sector at current and third lags, respectively; but inflation rate has a significant negative effect on financial sector output in the current period, while Interest rate (INT) and Credit to Private Sector had no significant effect on financial sector output within the short run periods in Nigeria. It thus recommended that the government employ inflation stabilisation policies and encourage export, and close borders to import on financial services into Nigeria.

**Keywords:** Macroeconomic variables, financial sector, money supply, inflation rate, exchange rate, interest rate, credit to private sector, Nigeria

## INTRODUCTION

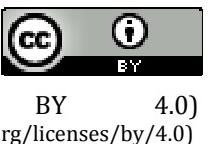
The financial sector is the hub of the productive activity of an economy as it performs the vital role of intermediation, provider of payment services and the fulcrum of monetary policy implementation. Financial systems have long been identified as a sector that has an important role to play in the development of any economy. The financial sector has been described as a catalyst for economic growth if it is developed and healthy (Adeoye, 2007). The reforms in the financial sector has enhanced the capacity of the market to provide windows of opportunities where large scale investors can raise funds to finance long-term projects and it has also led to increase in employment opportunities as a result of increase in number of branches of banks. Through financial intermediation functions of the financial institutions, savers are linked up. The financial sector as a prime mover of economic development, mobilizes savings from surplus to deficit economic units. This has helped in the productivity of any economy. The efficiency and effectiveness of financial intermediation is a subject of the level of the financial systems development. The financial system is dominated by banks which concentrated on short term lending as against the long-term investment.

The Financial sector reduces information and transaction costs in the economy. This facilitates more exchange of goods and services thereby allowing greater specification and productivity in the economy. The financial intermediaries can reduce information costs by acquiring and comparing information about many competing

**How to cite this paper:** Dr. Loretta Anayoozuah | Prof. Steve N. Ibenta | Dr. Ikenna Egungwu "Macroeconomic Variables and Financial Sector Output in Nigeria" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-5 | Issue-1, December 2020, pp.364-372, URL: [www.ijtsrd.com/papers/ijtsrd37966.pdf](http://www.ijtsrd.com/papers/ijtsrd37966.pdf)



IJTSRD37966



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investment opportunities on behalf of all their savers, thereby ensuring that capital is efficiently allocated. Financial sectors provide risk management services and reduce risks involved in financial transactions; they also ensure that each individual gets his money back whenever needed. By investing in projects, they facilitate risk diversification which increases returns and encourages more savings. The insurance sub-sector has been able to provide a safety net for entrepreneurs desirous of taking insurable risks and also help to reinforce and facilitate investment and mercantilism at both national and international levels (Uche, 2008). The development of the financial sector has always accentuated the growth in all sectors of the economy depending on the economic policy thrust and its implications.

Macroeconomic variables affect the nature and the direction of the economy in which a sector operates. Each sector must consider economic trends in the segment that affects its industry because the relative affluence of various market segments affects consumption patterns. Economic factors that must be considered by manager when taking financial decisions both national and international includes trends in the growth of gross national product, propensity of people to spend, prime interest rate and inflation rate (Pearce & Robinson, 2011). The Nigerian economy has been characterized by fluctuations in macroeconomic variables such as interest rates, inflation rates and the exchange rate.

## Theoretical Review

Financial sector is a section of the economy made up of firms and institutions that provide financial services to commercial and retail customers. Industries in the sector include banks, investment companies, insurance companies and real estate firms. A strong financial sector is a sign of a healthy economy and the reverse will be a weak economy. This sector helps to mobilize savings and direct funds into production sectors; that is, surplus money from the savings unit of the economy to the deficit unit of the economy. Among the core functions of the financial sectors is the provision or extension of credit facilities that facilitate economic activities. As improved economic activities engender productivity, the theoretical expectation is that the financial system enhances economic growth. The determinants of ability of financial sector to extend credit are money supply and interest rate.

It is theoretically expected that rapid rise in interest rate will result to drop in the demand for loans. This will result in increase in the cost of borrowing thereby reducing disposable income and this tends to reduce the rate of economic growth. Again by reducing reserve requirements of the financial sector, they have improved money supply and this leads to availability of money for lending, increased lending results to improved investment, improved productivity then economic growth. Government regulation can as well have a big effect on the financial sector.

According to Ibrahim and Alagidede (2018), early theoretical writers (Schumpeter, 1911 Kuznets, 1955 Palrick 1966) on financial system development show divergent views on the link between financial sector development and economic growth. The divergent views are the supply-leading and demand-following hypotheses. The supply side is of the view that development of a robust financial sector contributes to economic growth while the demand-following approach contends that growth of real economic activities increases demand for financial services and consequently the development of the financial sector.

## Empirical Review

One of the studies in the financial sector is the work of Awwad and Türsoy (2018) which investigated the dynamic interactions between the banking return index and selected macroeconomic variables in Turkey, from 1981 to 2014. The study was carried out using co-integration test; Granger causality test based on vector error correction model, variance decomposition analysis and impulse response functions. The National Banks Index LXBNK data are taken from the Borsa Istanbul website and used in natural logarithm form. The macroeconomic variables used include the Inter-Bank Interest Rate, EX is the real exchange rate and LM2 is the natural logarithm of Money supply which were collected from the International Financial Statistics and World Bank data sets. Long-run relationship exists among the variable through the co-integration test done for the period under review. Again, the Granger causality test showed that bank stock returns index Granger-cause the exchange rate.

Foong (2012) examined the impact of macroeconomic variables on Malaysia's bank industry's stock returns. The empirical analysis was carried out by using monthly data for the period from Jan 2006 to Dec 2010 and the study used

stock prices which were collected from Bank Negara of Malaysia. The Economic factors selected were the consumer price index, interest rate, money supply, exchange rate and the KLSE index. Ordinary least squares was applied and showed that four economic variables showed statistical significant relationship to the volatility to banks' stock returns. Exchange rate was affecting all the banks' stock returns while money supply had the biggest effect on banks' stock returns.

In Pakistan, Shahbaz (2010) studied the interactions among Pakistan's financial sector's performance and macroeconomic factors 1985-2012 and Fully Modified Ordinary Least Square (FMOLS) and the error correction method was used for the analysis. The data was tested for stationarity using Ng-Perron unit root test. It was revealed from the study that for increased performance of the financial sector, there should be rise in government spending and foreign remittances. Again, trade openness associated with capital inflows opened new opportunities to improve the Pakistans financial markets. On the contrarily, appreciation in inflation rates and the high savings rate decreased the efficiency in the overall financial sector.

Sohail and Zakir (2010) explored the long run and short run impact of five macroeconomic variables on the General Index of Karachi stock exchange. The analysis used to investigate this long run and short run relationship were Johansen Cointegration technique and the Vector Error Correction model (VECM). This study used monthly data from November 1991 to June 2008. The study indicated that the consumer price index, the real effective exchange rate and the industrial production index all had a positive impact on the stock prices. In contrast, money supply and the three month treasury bills rate had a negative effect in the long run. The variance decompositions showed that consumer price index and money supply had greater forecast error than the industrial production index, the three month treasury bills rate and the real effective exchange rate for the General Index.

Issahaku and Ustarz (2013) investigated the macroeconomic indicators of Ghana's economy and its effect on the stock market over the period starting from Jan 1995 to Dec 2010. Vector Error correction model was used on the selected variables, exchange rate, money supply, inflation rate and foreign direct investment. The existence of a long run relation between the stock price and foreign direct investment was revealed from the study and also the existence of a short run relation with the interest rate. Again, inflation and money supply showed both long and short run relationships with the stock price of Ghana.

Rjoub (2012) studied the dynamic relationship between exchange rates, US stock prices as a world market and the Turkish stock prices index, 2001 - 2008. Vector Autoregression (VAR) framework was applied and the study revealed the existence of a long run relationship. Further Granger causality test revealed a bidirectional relationship between exchange rates and stock prices. Again, there were temporary shocks on the Turkish stock prices; US stock price and exchange rates as revealed by the impulse responses.

Ahmet and Abdioglu (2010) empirically examined the relationship between the stock price and a set of

macroeconomic variables in Nigeria, March 2001-June 2010 and it was on a monthly basis. Variables chosen for the study includes, Consumer price index, the Foreign exchange rate, Broad money supply, Industrial production index and the Gold prices. Long run Granger non-causality techniques were used, the result revealed the existence of long run causality from to all macroeconomic variables selected in one direction.

Çağlı and Halaş (2010) examined the relationship between stock price index and a set of macroeconomic variables in Ghana, 1998-2008.. The variables include exchange rate, GDP, industrial production index, inflation rate, money supply (M2), interest rate and oil price and Gregory-Hansen test was applied. The result showed that there is a long run relationship, between (industrial production index, GDP and oil price) and ISE100 for the tested period with a presence of structured break.

One of the studies in Pakistan was done by Zugul and Sahin (2009) which investigated the nature of the relationship between stock price index and macroeconomic variables using a month time series spanning January 2004 to December 2008. In the study, exchange rate, money supply (M1), deposits interest rate and inflation were the explanatory variables while All Share Index served as the dependent variable. The result obtained from OLS analysis revealed that money supply, exchange rate and interest rate have a negative relationship with stock return index. On the other hand, the findings reveal a positive relationship between inflation rate and stock price index for the analyzed period.

Kandir (2008) investigated the role of macroeconomic factors on Istanbul stock exchange's returns from 1997 to 2005 on a monthly basis by applying multiple regression models. Seven macroeconomic variables were tested by the study and that included, the growth rate of all the following (industrial production, consumer price index, M1, crude oil price, exchange rate, interest rate and the world market index returns) all against non-financial firms. The study stated that the interest rate, exchange rate and the world market index returns all had a significant effect on the entire selected portfolio returns, while inflation rate was significant only for three portfolios out of the twelve analyzed. In contrast, industrial production, money supply and oil prices did not have any significant effect on stock returns.

Erbaykal, Okuyan and Kadioglu (2008), examined the relationship existing between the stock price Index and real macroeconomic variables in Pakistan as; consumption expenditure, industrial production, employment level, fixed investment and consumer price index, covering the period from January 1989 to February 2006. The findings revealed the existence of a negative relationship between the stock price and inflation. Again, the other macroeconomic variables have a positive relationship with the stock price. While, industrial production index, employment level and fixed investment were statistically significant.

In Nigeria, Ewing (2002), studied the relationship between the financial sector index and several macroeconomic factors from 1988 - 2000 using generalized impulse response analysis. It was revealed from the study that monetary policy shock reduces the financial sector's returns having a

significant initial impact effect which continues to affect returns for around two months. Moreover, unexpected changes in economic growth had a positive influence but exhibit no persistence. Inflation shock has a negatively and statistically significant initial influence which lasts for up to one month after the shock occurs in Nigeria.

Kanwal and Muhammad (2013), in their study looked at the impact of macroeconomic variables on profitability of public limited commercial banks in Pakistan, 2001-2011. The method used to examine the effect of 3 major external factors (real gross domestic product, inflation rate and real interest rate) on profitability indicators; return on assets, return on equity and equity multiplier ratios in 3 separate models. The existence of strong positive relationship of real interest rate with ROA, ROE and EM was indicated from the empirical result. Real GDP saw an insignificant positive effect on ROA, but an insignificant negative impact on ROE and EM. On the other hand, inflation had a negative link with all 3 profitability measures. Conclusively, inflation rate, real gross domestic product and real interest rate have negligible impact on earnings of commercial banks.

Kiganda (2014) investigated the effect of macroeconomic factors on bank profitability from 2008-2012. Data on government expenditure, inflation rate, cash inflow, export, private investment and dummy variable and Cobb-Douglas production function was used for transformation into natural logarithm. Ordinary least square was employed to establish the relationship between macroeconomic factors and bank profitability. The study established the fact that macroeconomic factors do not affect bank profitability in Kenya rather internal factors that relate to bank management significantly determine bank profitability in Kenya. Policies that will enhance managerial efficiency for higher profits were recommended by the study.

Nwala and Fodio (2019) studied the macroeconomic variables that affect financial sector development (FSD) in Nigeria, 1984-2017. Auto Regressive Distributive Lag (ARDL) model was used to analyse the data. Proxy for financial sector development was ratios of private sector credit to GDP. The empirical study revealed that money supply, interest rate, financial openness and inflation significantly explain financial sector development in Nigeria. Formulation of adequate policies, closer monitoring and creation of sustainable institution that will take adequate advantages of the benefit of these significant determinants by the relevant authorities were recommended by the study.

Ogeto (2014) examined the effect of macroeconomic fluctuations on the financial performance of listed manufacturing firms in Kenya. The result found is evidence that foreign exchange, interest rate and inflation rate have significant effects on the performance of the firms in the construction and manufacturing sectors. The effect of macroeconomic factors on the performance of the agricultural sector was however insignificant at 95% confidence level. The effects of macroeconomic factors were inconclusive and thus required further research. The study recommended that the government should re-strategize and make policies that will protect the construction, manufacturing and agricultural sectors due to their immense contribution to the economy. Government will do this by formulating policies that checkmate the effects of rapid

fluctuations of the macro economic factors and their effects on the various sectors.

Imegi and Wali (2018) examined the macroeconomics variables and financial marketing stability and its implication for marketing financial services in the Nigeria banking sector from 1986-2016. The included variables were on external debt, money supply, gross domestic product, oil price, inflation, interest rate. The quantitative research design was adopted for this study and secondary data was sourced and analysed using Ordinary Least Square (OLS) estimation technique for the purpose of providing answers to key research hypotheses. The study revealed that macroeconomic variable had a negative impact on Nigeria financial market.

Reviewed extant literature posit a conflicting positions on studies. For instance, studies carried out outside Nigeria such as Foong (2012) in Malaysia, Sohail and Zakir (2010) Karachi, Issahaku and Ustars (2013) in Ghana reveal that there is a positive relationship between macroeconomic variables and sectoral output. Other studies by Zugul and Sahin (2009) in Pakistan, Erbaykal, *et al* (2008) in Turkey show a negative relationship between macroeconomic variables and sectoral output.

## METHODOLOGY

### Research Design

The study adopted *ex-post facto* research design. The nature of the data is time series from secondary sources. The data covers a period of thirty three (33) years, spanning from 1986 to 2018. Data were collected from the Central Bank of Nigeria Statistical Bulletin, 2018. The specific variables are Gross Domestic Products (GDPs) for selected sectors of the Nigerian economy; and an array of macroeconomic variables which are exchange rate, money supply, credit to private sector, inflation rate and interest rate. The time period covered considered the deregulated economy when macroeconomic variables are determined largely by market forces.

### Description of Variables

The dependent variables are the sectoral outputs of the financial sector to the Gross Domestic Product of Nigeria.

**Money Supply:** Money Supply is the measure for the total amount of money in circulation which determines the availability of money (resources) for economic activities. The money supply used in this study is the broad money supply.

**Exchange rate** is the value of one currency for the purpose of conversion to another. It is the price of a nation's currency in terms of another currency According to (O'Sullivan &Sheffrin 2003). The measure employed in this study the exchange rate of official exchange rate of Nigerian Naira to the USA dollar.

**Inflation** rate used here measured the rate of changes in the prices of goods and services. It is theoretically expected that the higher the inflation rate the higher the financial activities (Cowart &Tihinen, 2013). Inflation rate, measured as percentage change in the average annual Consumer Price Index.

**Interest rate** is the rate at which interest is paid by borrowers for the use of money that they borrow from a lender. In this study, interest is the prime lending rate of the Deposit Money Banks in Nigeria.

**Credit to private sector** refers to financial resources provided to the private sector, such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable, that establish a claim for repayment Emecheta, and Ibe, (2014). It is measures the total financial services provided to the private sector annually.

### Model Specification

The fundamental and linear equation, which forms the model, is drawn from the theoretical literature and empirical literature reviewed in the previous chapter. It is observed that there is a causal link between macroeconomic variables and sectoral output

The model was a modification of the models from Foong (2012). The previous researchers used model:

$B_f = f(CPI, INT, MS, CPS)$ , representing (banking profit, current price index, interest rate, money supply, credit to private sector)

This present study included the variables as shown in the function below;

$$SOP_{FS} = f(MS, EXR, INF, INT, BCPS), \text{ Equation } (1)$$

Where:

$SOP_{FS}$  = Sectoral output on Financial sector

MS = Money supply

EXR = Exchange rate

INF = Inflation

INT = Interest rate

BCPS = Bank credit to private sector

The relationship can be explicitly formulated into an econometric equation thus:

$$SOP_{FS} = a_0 + a_1 MS + a_2 EXR + a_3 INF + a_4 INT + a_5 BCPS + p$$

Where  $a_0$  is a constant or intercept,  $a_1, a_2, a_3, a_4$  and  $a_5$  are the coefficients of the explanatory variables,  $p$  is stochastic error term.

### Appriori Expectation

This is based on the principle of finance theory, Here our results can be checked for their reliability with both the size and sign of finance a' priori expectation. It is expected that macroeconomics variables will exhibit the positive effect on sectoral output in Nigeria except inflation, interest rate and exchange rate.

VARIABLES	SIGN
MS	+
EXR	+ -
INF	-
INT	-
BCPS	+

### Method of Data Analysis

The study used multiple regression technique to analyse the effect of the variables in each of the six models. The steps involved in the data analyses process are three. They include

the descriptive statistics, test of stationarity of the time series variables, the tool for data analyses.

### Descriptive Statistics

The descriptive statistics was first used to define the characteristics of the variables employed for the study. The statistics analysed are the mean, minimum and maximum, and standard deviation. Mean is the average value of the series, obtained by adding up the series and dividing by the number of observations. Maximum and Minimum are the highest and lowest values of the series in the current sample, while the standard deviation is a measure of dispersion or spread in the series.

### Test of Stationarity

The stationarity of the variables was determined using the Augmented Dickey-Fuller (ADF) test. This is suitable because the use of time series data in a regression analysis can cause spurious results when the time series are not stationary. Thus, test of stationarity is a recommended pre-requisite for regression analyses. As time series data are often assumed to be non-stationary and it is necessary to perform a preliminary test to ensure there is a stationary relationship among the variables in order to avoid the problem of spurious regression whereby a significant relationship is found between variables in the regression model even though no such relationship exists between them (Kelly, 2000).

The ADF approach controls for higher-order correlation by adding lagged difference terms of the dependent variable to the right-hand side of the regression. The Augmented Dickey-Fuller (ADF) test is specified here as follows:

$$\Delta Y_t = b_0 + \beta Y_{t-1} + \mu_1 Y_{t-2} + \dots + \mu_p Y_{t-p} + \epsilon_t \quad (3)$$

Where,  $Y_t$  represents time series to be tested,  $b_0$  is the intercept term,  $\beta$  is the coefficient of interest in the unit root test,  $\mu_i$  is the parameter of the augmented lagged first difference of  $Y_t$  to represent the  $p$ th-order autoregressive process, and  $\epsilon_t$  is the white noise error term. In carrying out the unit root test, we seek to test the following hypothesis:  
 $H_0: \alpha=0$  (non stationary)  
 $H_1: \alpha\neq0$  (stationary)

If the null hypothesis is rejected, this means that the time series data is stationary. The decision criteria involve

## RESULTS AND DISCUSSION

**Table 1: Descriptive statistics of the variables used for the study**

SN	Variables	Mean	Max	Min	SD	Observations
1	SOPFS	879.03	3,449.00	10.32	1,104.60	33
2	M2	5,931.47	25,079.72	23.81	7,805.68	33
3	EXR	101.99	306.08	2.02	86.02	33
4	INFL	20.26	76.80	0.20	18.92	33
5	INTR	18.73	29.80	10.50	3.73	33
6	CPS	5,554.60	22,521.93	15.25	7,709.01	33

All the data were used at their natural states for the purpose of descriptive analyses. The statistics obtained are the Mean value, maximum value, Minimum value and standard deviation of the variables. The results are shown on Table 1.

The descriptive statistics for Sectoral output for manufacturing sector (SOPMAS) are: mean value (₦879.03 billion), maximum value (₦3,449 billion) and minimum value (₦10.32 billion). The standard deviation (₦1,104.6 billion) reveals a wide variation on financial sector output over the years. This explains the unstable nature of the financial sector in Nigeria.

comparing the probability value with 0.05 level of significance. If the p.value is less than 0.05, the null hypothesis is rejected.

### Tool of Analyses

Based on the stationarity trends of the variables employed, the Autoregressive Distributive Lag (ARDL) approach was employed for the regression analysis. This ARDL is the most appropriate regression technique since the time series for each model have variables are stationarity at both level 1(0) and first differences 1(1) (Narayan, 2005). The ARDL test has the capacity to accommodate both the short and long run trends in testing the relationship between the dependent and independent variables and is relatively more efficient in the case of small and finite sample data sizes (Harris & Sollis, 2003).

The core statistics employed for the analyses from the regression results are the coefficient of regression, coefficient of determination, F-statistics, t-statistics and their corresponding probability values, as well as the autocorrelation test.

#### 1. Coefficients of determination ( $R^2$ )

This is the summary measure that tells how well the simple regression line fits the data. It is a non-negativity quantity. Its limits are  $0 < R^2 < 1$ . An  $R^2$  of 1 means a perfect fit on the other hand an  $R^2$  of zero means that there is no relationship between dependent and independent variables.

#### 2. T- statistics

These tests show the significance of the parameter estimates. The obtained value of the T- ratio will be compared with the tabulated value the decision rule is that when the calculated value of t-statistics is greater than the t value at 5% level of significance and n-k degree of freedom. The null hypothesis will be rejected and the alternative accepted.

#### 3. F-statistics

This measures the overall joint significance of the entire regression plane. It aims at findings if the entire influences of the explanatory variations do actually have any significance influences on the dependent variables. When the tabulated F is more than the calculated F at 5% level of significance and n-k degree of freedom the null hypothesis rejected and the alternative accepted (Koutsoyiannis, 2001).

## Stationarity Tests

The variables were subjected to stationarity test using the Augmented Dickey-Fuller (ADF) Tests, to determine whether they are stationary series or non-stationary series. The null hypothesis of the ADF is that the variables have unit root. Presence of unit root implies that the variable is not stationary. The results of the stationarity tests are presented on Table 2.

**Table 2: Stationarity of the variables used in the study**

Variables	At Level		First Difference		Order of Integration
	t-Statistic	Prob.	t-Statistic	Prob.	
LogSOPFS	-1.276160	0.6283	-5.465665	0.0001	1(1)
LogM2	-2.318267	0.1728	-3.478318	0.0155	1(1)
EXR	1.300393	0.9981	-3.986222	0.0045	1(1)
INFL	-2.710941	0.0832	-4.919486	0.0005	1(1)
INTR	-4.606132	0.0009	-	-	1(0)
LogCPS	-1.359530	0.5889	-3.910687	0.0054	1(1)

The ADF results revealed that INTR is stationary at level 1(0) while other variables including LogSOPFS, LogM2, EXR, INFL and LogCPS become stationary at their first differences 1(1). From the results of the ADF tests, it can be seen that the variables that made up each of the models have a combination of level 1(0) and first deference 1(1) stationarity. The variables stationary at level implies that they are not time variant while the ones stationary at first deference suggest that they respond to changes in time periods. Under this situation, the ARDL is the most suitable regression technique for the study.

## Model Estimation

The Autoregressive Distributive Lag (ARDL) technique was used to investigate the effect of macroeconomic variables on economic output of selected sectors in Nigeria. The two forms of regression analysis conducted are the Bound test and ARDL Short run regression estimation.

The test of cointegration for the presence of a long-run relationship in the models is shown in Table 2. The ARDL results compared the bound critical values with the F-statistics values. The decision rule is: If the F-statistic is above the upper and lower critical bound values, then there is a long run relationship in the model; but where the F-statistics is below the upper and lower bound critical values, it is inferred that there is no long-run effect (relationship). The null hypothesis is that "No long-run relationship exists".

**Table 3: ARDL Bounds Test for long run effect of Macroeconomic variables on financial sector output**

ARDL Bounds Test		
Sample: 1989 2018		
Included observations: 30		
Test Statistic	Value	K
F-statistic	3.573617	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

From the results in Table 3, the critical bound values were computed at 5% level of significance. The lower critical bound value is 2.62 while the upper critical value is 3.79, while the F-statistics is 3.5736. The results showed that F-statistics greater than the Upper (3.79) and Lower (2.62) critical bound values.

Since the F-statistics fall outside the critical bound values, the null hypotheses is not rejected. The study thus posited that macroeconomic variables (money supply, exchange rate, inflation rate, interest rate and credit to private sector) do not have significant long-run effect on sectoral output of the financial sector in Nigeria.

## Estimation of Short Run Effect of Macroeconomic Variables on Financial Sector Output

The short-run effects of macroeconomic variables on financial sector output is analysed using the Auto-regressive Distributive Lag (ARDL) model. The ARDL regression model is preferred to the traditional OLS following that the variables were integrated into a mixture of level 1(0) and the first difference (1(1)). The analyses are interpreted based on the coefficient of the explanatory variables, and the coefficient of determination (R<sup>2</sup>). The statistical significance is confirmed using the t-statistics for the coefficient of regression, and F-statistics for the coefficient of determination. The analyses of the short run relationships are presented on Tables 4.

**Table 4: Short Run Model of the Relationship between Macroeconomic Variables and Financial Sector in Nigeria**

Dependent Variable: SOPFS				
Method: ARDL				
Dynamic regressors (3 lags, automatic): M2 EXR INFL INTR CPS				
Fixed regressors: C				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
SOPFS(-1)	0.278264	0.213089	1.305858	0.2161
SOPFS(-2)	0.006606	0.218260	0.030268	0.9764
<b>M2</b>	<b>1.048216</b>	<b>0.448317</b>	<b>2.338112</b>	<b>0.0375</b>
M2(-1)	-0.874177	0.728646	-1.199728	0.2534
M2(-2)	-1.218380	0.796713	-1.529258	0.1521
EXR	0.000269	0.000792	0.339413	0.7402
EXR(-1)	0.000588	0.001197	0.490940	0.6323
EXR(-2)	-0.001146	0.001252	-0.915601	0.3779
<b>EXR(-3)</b>	<b>0.004112</b>	<b>0.001123</b>	<b>3.662530</b>	<b>0.0033</b>
<b>INFL</b>	<b>-0.004850</b>	<b>0.001618</b>	<b>-2.998251</b>	<b>0.0111</b>
INFL(-1)	0.001963	0.002175	0.902795	0.3844
INFL(-2)	-0.000336	0.001487	-0.225966	0.8250
INFL(-3)	0.000863	0.001060	0.814176	0.4314
INTR	-0.000453	0.008752	-0.051787	0.9596
CPS	0.541215	0.429203	1.260976	0.2313
CPS(-1)	0.146750	0.345184	0.425135	0.6783
CPS(-2)	0.586960	0.336366	1.745004	0.1065
C	0.794869	0.413379	1.922858	0.0785
R-squared	0.996885	Durbin-Watson stat	2.203897	
Adjusted R-squared	0.992473			
F-statistic	225.9241			
Prob(F-statistic)	0.000000			

The ARDL result of the short-run effect of macroeconomic variables (M2, EXR, INFL, INTR and CPS) on financial sector output in Nigeria is presented in Table 9. The coefficient of the dependent variable (SOPFS) introduced as an endogenous variable in the model showed a positive value at lag 1 and lag 2 but no significant effects on both periods. This indicates that financial sector output is not an endogenous variables in the model. This implies that previous financial sector outputs are not determinants of current output in Nigeria.

Table 4 further revealed that Money Supply (M2) has a positive relationship at current period and negative relationship at lags 1 and 2. This suggests that a unit change in money supply would bring about a 1.04 unit positive change in financial sector in the current year and 0.87 and 1.21 units of fall after year one and two, respectively. However, the p.value of M2 coefficient only had a statistically significant effect on financial sector output of the current year.

Again Exchange Rate (EXR) was found to have a positive relationship with financial sector output (SOPFS) at current year and lag 3 and a negative relationship at lags 2, but statistically significant in year 3. This indicates that a unit increase in EXR leads to 0.004 units of fall in financial sector output after three (3) years.

More so, Inflation rate (INFL) showed a positive relationship at lag 1 and 3 but negative relationships in the current

period and at lag 2. However, the p.value indicated significant effect in the current period. This indicate that inflation rate has a significant negative effect on financial sector output in the current period.

However, Interest rate (INT) and Credit to Private Sector had no significant effect on financial sector output within the short run periods under study. This suggests that interest rate and Credit to Private Sector will not affect financial sector output within the framework of a macroeconomic policy in Nigeria within the short-term periods of economic planning.

On the overall, the adjusted coefficient of determination (Adj R<sup>2</sup>) revealed that about 99% of the change in financial sector output (SOPFS) can be explained by the selected macroeconomic variables in Nigeria. This is confirmed by a significantly significant p.value of 0.0000 from the F-statistics (225.92). The Durbin-Watson statistics of 2.2039 suggests that the result is reliable.

### Discussion of Findings

The results revealed that macroeconomic variables had 99% significant short run policy effect but no significant long run effect on financial sector output in Nigeria. The nature of the short term effect is such that in the current year of policy implementation, money supply (M2) would spur a significant enhancement on financial sector output; whereas exchange rate and inflation rate initiates adverse growth influence which would later on, in the third period of the

implementation, join to drag financial sector output down. These variables would regulate the fluctuations in prices of products in Nigeria and hence strengthen purchasing power as well as external competitiveness of Nigeria. On the other hand, money supply can be improved through effective monetary policies. This when achieved, according to this study, would enhance financial sector output to Nigerian economy. This means that growing volume of money in circulation would assist the financial sector to have adequate resource to finance the economy which will in turn increase earnings.

The findings of this study align with the theoretical postulations of the Solow-Swan model, in which capital accumulation vis-à-vis money supply and credit to private sector are determinants of growth of output. Other macroeconomic variables as exchange rate and inflation are rightly signed to have adverse effects on economic growth as posited in the theory. The findings equally supported a number of extant studies, both in Nigeria and abroad. For instance, the work of Awwad and Tursoy (2018), Issahaku and Ustarz (2013), Foong (2012) and Shahbaz (2010) all posited that macroeconomic variables influences financial sector performance. On the premise of these findings, it can be posited that macroeconomic variables is the determinant of all economic prosperity.

### **Conclusion and Recommendations**

The study has investigated the effect of macroeconomic variables on sectoral outputs of the financial sector in Nigeria within a time frame covering 33 years from 1986 to 2018. A model of hypothesised relationship between macroeconomic variable and financial sector was developed. The Autoregressive Distributive Lag approach that is capable of combining time series at both level 1(0) and first difference 1(1) was employed for data analysis. The study posited that macroeconomic variables have significant short run policy effect but no significant long run effects on financial sector output in Nigeria. It is recommended that the government employ inflation stabilisation policies. This is because inflationary trends tends to undermine output levels of the financial sector. Inflation stabilization policies such as price ceiling should be deployed on financial services. Also, as rising exchange rate of Naira to other currencies has had adverse influence on financial sector outputs in Nigeria, it is also recommended that the policy makers should encourage export, close borders to import on financial services into Nigeria.

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